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INFORMATION REPORT

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COUNTRY Hungary Z-2953

SUBJECT
National Physical Culture Sport-Health

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SUPPLEMENT TO REPORT #

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1. The mission of the National Physical Culture Sport-Health Research Laboratory was to enhance the position of Hungary in sports competition through the discovery of strengths and weaknesses in training methods, coaches, trainers and athletes. This discovery was conducted by means of a system of periodic testing of individual athletes.

2. All elite sportsmen were observed and considered for selection for intensive training and preparation for competition. The best were brought to a national sports center of which a 300 bed hospital was an integral part. The testing system devised and supervised by Dr Istvan Lichtnechtert was an important element of the training and preparation. 25X1

3. As a result of modern technology the human organism is facing new tasks. This means primarily that our activities are requiring less and less muscular strength, calling rather for the ability to engage in delicate and swift movements and high level mental application and concentration. In support of this statement it is sufficient to refer to the various tasks of operating and servicing machines in industry. The various "dexterity" sports are all designed to improve as much as possible the aforementioned abilities; their development is also served by the program of physical education for the young.

4. Specialized literature uses several different terms to characterize the ability to engage in swift movements accompanied by a high power of concentration. Such terms as "efficiency", "ability", "performance", "capacity". In the following we shall term the above mentioned faculties generally as "capacity", referring to them briefly as "C".

5. From a physiological viewpoint we are facing a new method of determining human work capacity. This is not concerned with the amount of horsepower one may be able to generate; rather, it attempts to answer several new questions.

6. This new notion becomes more lucid when compared with the old one. The primary element in the determination of work capacity used to be the ability to generate muscular power. Therefore we call this "strength" performance and refer to it as "S".

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7. A COMPARISON OF "C" AND "S" PERFORMANCES

"C"	"S"
(a) What swift and delicate movements is one fit to perform (able to master)?	(a) How much muscular strength is the individual able to exert?
(b) What is the endurance of the individual in performing delicate and swift movements?	(b) How long can a person engage in top strength performance (endurance)?
(c) What is the potential "C" condition of the individual?	(c) What is the actual physical condition of the individual (his potential top strength)?

8. The "S" performance depends on muscular strength, blood circulation, respiration. The "C" performance is determined primarily by the functioning of the central nervous system. For the measuring of the "S" performance, physiology has many methods of determining the elements of accomplishment on a comparative basis. These methods are based upon ergometer and dynamometer gaugings, blood circulation and respiration tests, or a combination thereof. They are widely used. Their common shortcoming is that in determining the rate of fatigue, they provide acceptable data only as a result of comparative and repeated tests, but are unable to afford absolute, immediate measurement.

9. For the measuring of "C" performance, as of 1956, we did not know of a unified method, although to have one would be most desirable for the purposes of industry, the armed forces, transportation, sports, etc. There are innumerable gauging methods. In practice everyone would be satisfied with a method best suited to the purposes in view. How does this present itself in everyday life? The candidate must perform a task requiring the utmost concentration and delicate movements, while being gauged on an instrument which is more or less similar to the machine which he desired to operate in the future (if he is found fit, qualified for the task). Each of the qualities of the movements (duration, speed, precision) is recorded. Comparing the results with the standards of experience will determine the final evaluation.

10. These tests confront the candidate with complex problems, and of course the result is likewise complex. No doubt the tests, even in this form, are of help in the difficult task of selecting candidates for various jobs, although some of the tests are hardly better than the judgment of an experienced specialist. Nothing offers a better justification for these "C" performance tests than the fact that while they can hardly be called adequate, they were found to be worth applying. As of 1956 the physiological foundations of the "C" performances were unknown.

11. We gave preliminary consideration to these facts before we began our work. Our starting point was the presumption that behind the thousands of different methods identical physiological phenomena must prevail. We must find a way to discover the common physiological conditions of all wilful body movements.

12. We worked out a new method by which free introspection is gained into the manner in which a series of movements is performed. As a result one can observe the way the central nervous system functions in connection with wilful physical action. In some respects we may receive a clear picture as if we were looking through a window upon the field of impulses.

13. The substance of the method is the recording, never done before, of time as a component of the movements. Every wilful movement is a result of a number of decisions. We record within a very short time the thousands of decision or execution time periods that elapse between the impulse and the action. Our method assures the accuracy of these registrations to the extent where the recordings are perfect reflections of the occurrences in the human organism.

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The time values recorded in thousands of a second connect with each other on the film and provide a true graphic line capable of immediate evaluation. The recordings indicate the occurrences in the human organism between the birth of the impulse and the consummation of the movement.

14. OBSERVATIONS MADE AS OF 1956

(a) According to "C" performance, individuals may be classified into types: accurate, fast, normal, below normal and slow performance.

(b) The individual may maintain his "C" performance rate at a maximum for a few seconds, after which will follow a succession of alternating lesser values with periodically recurring maximum ratings.

(c) The undulations of the line graph become elongated with fatigue.

(d) "C" performance (over-all) of individuals accustomed to physical labor improves as work progresses.

(e) "C" performance is subject to general disposition, mood. The performance can be increased or decreased by hypnotically created moods.

(f) "C" performance may be controlled by stimulants. Some of the drugs have an adverse effect (aktedron). Others accelerate the motions, but after a while they have an adverse effect on precision (experiments in tennis and other sports with ritalin). Drugs relieving tension improve performance (experiments with oblivion).

(g) "C" performance is greatly dependent on normal respiration. Increased or obstructed breathing lowers its rate.

(h) Top "C" performance may be attained by a rate of movements which is characteristic or typical of the individual. This may be established by feeding alternately quickening, then slowing, impulses. The best performance is characteristic. With slow motions the performance deteriorates. At a fast pace (above optimum) inefficient movements appear. This fact is of great significance; at speeds above this specific optimum the industrial worker produces inferior-quality work. The borderline is measurable (establishable).

15. We also conducted fatiguing experiments, using the optimum pace of performance. Numerous other related data are at our disposal but their significance has not yet been established. As of 1958, Dr Istvan Lichtneckert is conducting scientific work at the Institute of Physiology of Lund, under the title, "Respiration and Reaction Time" as this Institute is specializing in respiration.

16. This method may also have great prospects in the US in selecting the right individuals for industry and sports, and in keeping a continous check upon their condition.

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